

REVIEW OF THE SAWFLY GENUS *LAGIUM*
(HYMENOPTERA: TENTHREDINIDAE)

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Abstract.—*Lagium* includes a single species, *L. atroviolaceum* (Norton), which occurs in eastern North America. The color of the abdomen used to separate the two previously recognized species is found to be unreliable for species separation; therefore, *A. tardum* Norton is a **new synonym** of *atroviolaceum*. Larvae feed on *Sambucus* and *Viburnum*. The genus is characterized, and the female ovipositor and male genitalia of *atroviolaceum* are illustrated.

Lagium includes a single species, *L. atroviolaceum* (Norton), which occurs in eastern North America. The larvae feed on the foliage of *Sambucus* and *Viburnum*. Konow (1904) described the genus and based it on the North American species, but he also included two species from eastern Asia. The Asian species, though very similar to the North American one, have since been placed in another genus, *Lagidina* Malaise (1945).

Rohwer (1912) was the first to study *Lagium* in detail. His study indicated the presence of six species, separated by "trivial characters, except in the males where the genitalia offer good differences." He distinguished them by color, slight differences in the shape of the female sheath, slight differences in the shape of the labrum, and differences in the shape of the harpe of the male genitalia. Even though Rohwer's illustrations show differences, the harpe is very thin, and when the specimen is dry, it may bend and dry in slightly different configurations thus appearing to be different. Also, Rohwer's illustrations appear to be at slightly different angles. Ross (1951) listed two species, separated by color, *L. tardum* (Norton) having a mostly orange abdomen and *L. atroviolaceum* a black abdomen. After study of the female ovipositor, characteristics of the male genitalia, sculpturation of the body, sheath shape, and other features, I found no reliable differences on which species could be separated. All specimens have similar structural features. I could not distinguish consistent differences in sheath shape and labrum shape as Rohwer did. Although individuals may have either a red or black abdomen with no apparent intermediates, they are morphologically identical, and I consider them color forms of the same species.

Lagium Konow

Lagium Konow, 1904: 246. Type species: *Allantus atroviolaceus* Norton, by original designation.

The following will separate *Lagium* from other genera of North American Tenthredininae: Each mandible with 2 teeth; clypeus subtruncate to slightly circularly emarginated at center; eyes small, inner margins subparallel, far apart with lower interocular distance greater than eye length; malar space equal to diameter of front ocellus; occipital carina present, extending to top of head but absent behind postocellar area; antenna long, $2.4\times$ head width, slender, setaceous, 1st segment longer than broad, 2nd segment about as long as broad, 3rd segment longer than 4th segment, segments 4 to apex decreasing gradually in length; tarsal claw with inner tooth subequal in width and length to outer tooth, not appressed to outer tooth, basal lobe absent; hindcoxa large, causing apex of hindfemur to nearly reach apex of abdomen; hindbasitarsus subequal in length to following segments combined; forewing with anal crossvein short, perpendicular, situated near base of wing, distal anal cell twice length of proximal anal cell; hindwing of female with anal cell petiolate, petiole about half width of cell at widest point, cells Rs and M present; hindwing of male with partial peripheral vein, absent only between radial cell and cell M; basal plates separated by a medial suture; cenchri small, far apart, nearly $3\times$ farther apart than breadth of one.

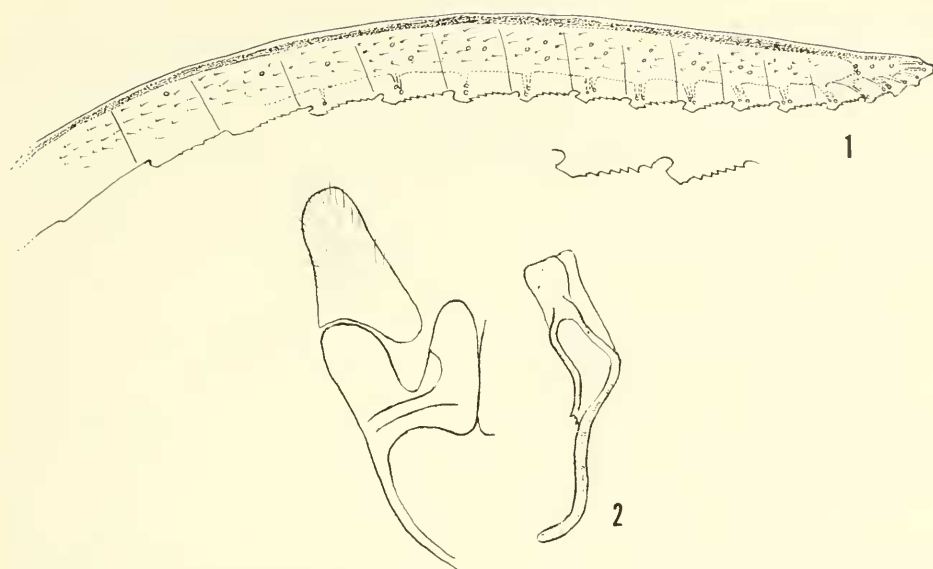
The most characteristic features are the long distal anal cell which is $2\times$ the length of the proximal anal cell, the long inner tooth of the tarsal claw subequal in length to the outer tooth, small eyes with the lower interocular distance much longer than the eye length, bidentate mandibles, and subtruncate clypeus. The genera with which *Lagium* is most likely to be confused are *Leucopelmonus* (which has a smaller inner tooth than outer tooth on the tarsal claw and a deeply emarginated clypeus); *Aglaostigma* (which has the proximal anal cell of the forewing subequal in length to the distal anal cell and the anal crossvein at an angle); *Rhogogaster* (which has tridentate mandibles and a deeply emarginated clypeus), and *Macrophya* (which has quadridentate mandibles, extremely enlarged hindcoxae causing the apex of the hindfemur to exceed the length of the abdomen, and the eyes usually large with the lower interocular distance less than the eye length). *Lagium* may be separated by using Ross' 1937 key.

The Asian genus *Lagidina* contains about six species. Though sharing most characters with *Lagium*, they are distinguished by the compressed antennae, more strongly so in the males, and the complete peripheral vein in the hindwing of the males; in some the occipital carina is also present behind the postocellar area. Known hosts for the Asian species are *Glechoma* and *Viola* (Okutani, 1963). Okutani (1963) described the larvae of two Japanese species. They appear similar to the larva described by Dyar (1897) in being flattened and having thick papillae on the body, but it is difficult to compare the two descriptions.

Norton (1860) described the first two species belonging to *Lagium*, but later (1868) he regarded one, *tarda*, as only a color variety of the other, *atroviolaceum*. Dalla Torre (1894) placed this species in *Tenthredopsis* (a genus restricted to the Palearctic Region) following Provancher (1888). Rohwer (1912) treated six species of *Lagium* (including three new species), but only two were later listed by Ross (1951) and Smith (1979). Currently, only the following species is recognized.

***Lagium atroviolaceum* (Norton)**

Tenthredo atroviolaceus Harris, 1835: 583. Nomen nudum.
Tenthredo tarda Harris, 1835: 583. Nomen nudum.



Figs. 1-2. *Lagium atrovioleaceum*. 1, Female lancet, with closeup of central serrulae. 2, Male genitalia, left half of genital capsule, ventral view, at left; lateral view of aedeagus at right.

Allantus atrovioleaceus Norton, 1860: 255 (♀, ♂, described from Connecticut and Massachusetts; type ♀ in MCZ labeled "350 u" "Type #26299").

Allantus tardus Norton, 1860: 246. (♀, ♂, described from 5 specimens from Connecticut, Massachusetts, and Maine; types not located). **NEW SYNONYMY.**

Tenthredo atrovioleacea var. *peratra* Dyar, 1897: 192. (♂, larva; Franconia, New Hampshire; type in USNM).

Lagium angulabre Rohwer, 1912: 215 (♂, Baldwin, Kansas; type in USNM).

Lagium planifrons Rohwer, 1912: 216 (♀, ♂, from several Virginia localities; type ♀, E. Falls Church, Va., in USNM).

Lagium erythropus Rohwer, 1912: 214 (♀, Baldwin, Kansas; type in USNM).

Female.—Length, 13–16 mm. Black; apex of mandible dark reddish, labrum may be brownish; hindcoxa with white stripe on dorsolateral margin, not reaching apex of coxa; extreme apex of forefemur, outer surface of foretibia and foretarsus whitish; abdomen black or orange, the latter usually with orange on segments 2–6 and part of 7 but sometimes with sterna blackish. Wings uniformly, darkly, black infuscated; veins and stigma black. Sheath slender, of approximate uniform width in dorsal view, rounded at apex in lateral view. Lancet as in Fig. 1.

Male.—Length, 11–13 mm. Color similar to that of female; white line on hindcoxa may be absent, but same area usually somewhat paler than rest of coxa; outer surface of fore- and midfemora and outer surface of apical half of hindfemur may be dark orange in some specimens that have an orange abdomen. In specimens with orange abdomen, orange present on segments 2 to apex except for blackish apex of hypandrium. Genitalia as in Fig. 2.

Larva.—Known only from the description by Dyar (1897) who stated that it is a "very curious one." "Looks a little flattened, but thick and robust. Feet on joints 6–13. Head round, dull black; width 1.4 mm. Body segments 7-annulate, the

whole body soft dark gray, the ground color uniform. A series of short thick papillae, one on each annulet in subdorsal and lateral even regular rows, and other smaller ones scattered subventrally. First row (subdorsal), which is the shorter, has the papilla on annulet 1 orange, 2–4 black, 5–6 orange, 7th black; second row (lateral) which is larger, has 1st to 4th orange, 5th to seventh black; two behind the spiracle and two subventrally posteriorly pale orange; two groups of six to eight very small ones on the upper and lower subventral folds whitish. Sides with a number of small black spots. On thorax there are less of the papillae, but the alternation in color is similar. Anal plate not differentiated.

Ultimate stage.—Smooth, very shiny, entirely dark slaty blue black, papillae indicated by very small concolorous points. Thoracic feet pale.”

Characteristic of the Tenthredininae are the 7-annulate segments. However, *Lagium* is difficult to distinguish from other genera since larvae of others have not been adequately defined. The flattened appearance and obvious papillae with alternating coloration may help in its recognition.

Distribution.—Eastern North America from New Brunswick to Georgia west to Ontario, Minnesota, Iowa, Kansas, Oklahoma, and Louisiana. I have seen specimens from the following states and provinces: District of Columbia, Connecticut, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Brunswick, New Hampshire, New Jersey, New York, North Carolina, Oklahoma, Ohio, Ontario, Pennsylvania, Quebec, Rhode Island, South Carolina, Tennessee, Virginia, West Virginia, Wisconsin.

Hosts.—Reared from larva on elder, *Sambucus* sp., by Dyar (1897). A specimen in the USNM was reared from *Viburnum* sp. at Middleboro, Massachusetts. Both hosts are in the Caprifoliaceae.

Ecology.—Dyar (1897) did not expand on the life history but stated that the larvae enter the earth to form a “moderately firm hibernating cell.” There is probably a single generation a year since adults have been collected only in spring and early summer. Flight periods range from April 21 to August 3 (earliest and latest records I have seen) with most in late May through June. In Canada they have been collected from May 20 to July 9; in the central Atlantic states from May 25 to July 6; and in the midwestern states from May 12 to July 15. In a Malaise trap situated in a stream bed with low mixed vegetation in Louisa Co., Va., 52 specimens were collected from May 25 to June 29, 1985; males were most common in the first half of the collecting period whereas females were most abundant in the latter part (Table 1). According to specimen labels, adults have been collected on *Ceanothus*, on *Ceanothus* flowers, on *Myrica certifera*, and in vegetation along streambank. I have found them in sweepings of low vegetation in open deciduous forests near streams or rivers. Habitats of the host plants are the obvious places to look for this species.

Discussion.—The general habitus of this species, being a large sawfly, black or black with an orange abdomen, and with black wings, will help distinguish it from most other Tenthredininae.

I was unable to find differences in sheath or labrum shape or differences in the structure of the harpe of the male genitalia as was reported by Rohwer (1912). Based on identical morphological features, I regard both color forms to represent the same species even though I have not found evidence of intermediates in color except a few specimens of the red abdomen form that have a slight degree of

Table 1. Seasonal occurrence and numbers of specimens with a red and black abdomen collected in a single Malaise trap in Louisa Co., Va., 1985.

Collection Date	Black		Red		Total
	♀	♂	♀	♂	
May 25	0	2	0	1	3
June 1	1	5	0	2	8
June 9	3	12	5	0	20
June 15	5	2	5	0	12
June 29	3	1	5	0	9
Total	12	22	15	3	52

infuscation on the venter. Color alone cannot be considered a reliable character unless supported by morphological or biological differences, neither of which are evident.

In collections, specimens of the black form outnumber the red form 2.5:1 (approximately 460 specimens examined; 330 black, 130 red). In mapping the occurrence of the two color forms, there is an indication of a north-south cline, the black form more common in the north and the red form in the south. All specimens examined from New Brunswick, Maine, Quebec, the Ottawa area of Ontario, and Minnesota were black. Mixed collections are found from New Hampshire, southern Ontario, Michigan, and Wisconsin south to South Carolina and Kansas. The few specimens examined from Georgia, Oklahoma, and Louisiana were the red form. There was no indication of an east-west pattern. Of the 52 specimens collected in the trap in Louisa Co., Va., in 1985, 34 were black and 18 red. More red females than black females were caught, but there were 7× more black males than red males (summary of collections in Table 1).

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